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EXAMINING A REQUIRED SOFTWARE APPLICATIONS COURSE AT A FOUR-YEAR UNIVERSITY

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ABSTRACT

This paper examines whether a required one-credit hour, undergraduate, software applications course is still needed at the university level. Because many of today's university students have grown up having computers available at school and in the home, some faculty, administrators, and students have begun to question whether a course teaching application skills with the Microsoft Office Suite is still necessary. This paper examines the students' computer skills before and after the course and looks at the relationships between various colleges and the students' skill level before and after the course.

Keywords

Software applications, computer literacy, digital literacy, Microsoft Office Suite

INTRODUCTION

A medium-size, liberal-arts-based, four-year university has required a one-credit hour course in software applications for all students for the last eight years. This course has lately encountered a number of concerns. Some faculty and administrators believe that students now come to college already possessing the skills covered by the course. While this has not been found to be the case in the past (Robinson & Thoms, 2001), we wanted to reexamine this premise for our student body. After an analysis of other universities, administrators feel that most schools are now going away from requiring this course of all students. Faculty and administrators believe that this course should perhaps cover different topics if it is taught. In order to determine if these concerns are valid, an analysis of current student performance in the course was conducted to determine whether the students already possessed the requisite skills required to use the Microsoft Office Suite of applications and whether students performed better in the course over time.

THE UNIVERSITY AND ITS FOUR COLLEGE MODEL

The University is an accredited medium-sized university consisting of over 5,000 students with over 4,000 of them being undergraduate students. The university is accredited by SACS and the College of Business is AACSB accredited. It is comprised of four colleges: (1) College of Arts and Letters, (2) John H. Sykes College of Business, (3) College of Natural and Health Sciences, and (4) College of Social Sciences, Mathematics and Education. The University also offers Graduate and Continuing Studies that allows undergraduate students to return to school part-time to earn their bachelor's degree. Undergraduate students from all colleges must complete a Baccalaureate Experience which has as one of its goals, "To demonstrate an understanding and proficiency in the use and application of computers across fields of learning."

CURRENT INTRODUCTION TO COMPUTERS CURRICULUM

In the late 90's, the University required that all undergraduate students take a three credit-hour course in Introduction to Computers. This course included information from a typical introductory book and hands-on work with software applications. Students often complained that they shouldn't be required to learn about the "history" of computers which is how they referred to the textbook material. Many faculty members agreed with this. In response to these concerns, a new course was developed.

UT now requires a one-credit-hour course in software applications of all students who attend the university—both graduate and undergraduate. The graduate students must attain an intermediate skill level in Microsoft Word, PowerPoint, Excel, and Access. The undergraduate students must attain an intermediate skill level in Word, PowerPoint, and Excel. These courses must be taken the first year of study. The intent is to have the students all have the skills necessary to use the applications in classes without the instructor needing to provide instruction on the basics of the application.

Frequently, the students believe they possess sufficient knowledge prior to taking the course. For those students, a hands-on waiver exam is available to permit those with the requisite skills to waive the requirement of taking the course. This standardized waiver exam software is used by over 100 schools nationwide. The waiver exam may be taken only once, and no course credit is given for successfully completing it. Some students choose to take the course even if they feel they have the requisite skill level. Approximately 4% of the undergraduate students who were enrolled for the course took the waiver exam. Of those, about 33% passed it. 38% of the eligible graduate students took the waiver exam with about 60% passing it. The low pass rate seems to indicate that undergraduate students are not as familiar with the Microsoft Office Suite as one might assume based on the ubiquitous access current college freshmen have had to computers over the course of their lives. While many students are fluent in the use of web browsers and social media, they may not have the requisite skills for successful use of software in their college courses.

An on-line software package is used for both training and testing of the software applications. This software is used by over 3,000 schools in the U.S. *Introduction to Computers (ITM 200)* is taught through a combination of approaches. The class meets one hour a week. The students meet for the first two weeks in large lecture halls (60-80 students). A Ph.D. instructor uses those two sessions to introduce the course, demonstrate the on-line software and demonstrate Blackboard which is used to communicate with the students. Two other sessions are conducted in the lecture hall during the term--an overview of Microsoft PowerPoint and an overview of Excel. The students meet the remainder of the weeks in labs of 20 with a lab instructor who is a MBA graduate assistant.

In the labs, the students use an on-line tutorial to train themselves in Word, PowerPoint, and Excel. All of this on-line material is also available on every computer on campus, and students can use it at home if they have access to the internet. Students practice at their own pace both in and out of lab, as needed, but they must take a proctored exam in the lab by an assigned date. Students may take exams early, but each exam may be taken only once. Attendance is required up to the point when the student takes an exam, after which, the student is no longer required to attend lab until after the lecture on the next application.

The software includes two parallel databases of skill assessment in Word, PowerPoint, and Excel. One of the databases for each application is divided into several somewhat equal parts and provided to the students as "Practice Exams". The student takes one of the Practice Exams for an application after which the software generates "Training" based upon the skills that were performed incorrectly during the practice exam. After the student successfully completes the training for that practice exam, he/she is then permitted to repeat the practice exam and training again as many times as they choose. This process is completed for each of the parts of the database for each application. These practice exams and training are strongly encouraged, but are not graded. The graded exams are skills that are randomly chosen from the three practice exams.

METHODOLOGY

To determine how well the students were doing after completing the training and whether students were becoming more familiar with the software over the course of time due to their exposure to computers in college for a semester, we examined the performance of students taking the ITM 200 course over a one year time period. If the ubiquity of computers and exposure to software were to be having a significant impact, one would expect the course grades to be improving from semester to semester. We therefore first looked at the quality points of students for the Fall Semester and then compared them to students in the Spring. A pooled variance t-test for the difference in two means was conducted to determine if students were performing better in the course from semester to semester, followed by an Analysis of Variance (ANOVA) for the two semesters of the study. Then a separate ANOVA was conducted to determine if there was a difference in overall performance between the different colleges of the university.

RESULTS

At first glance, it appears that students might be more adept at using the software because the GPA for all students in ITM 200 in the fall semester was 2.7305 while the spring semester students averaged 2.7587. To determine whether this anecdotal evidence was in fact statistically accurate, we then conducted a 2 sample hypothesis test. If students were actually more adept at using the software, we would expect GPAs to be increasing. Therefore, our hypothesis was:

H_0: $\mu_{Fall09} - \mu_{Spring10} \leq 0$

Versus

H_1: $\mu_{Fall09} - \mu_{Spring10} > 0$

The results of the pooled variance t-test showing the difference between the means are presented in Table 1.

Level of Significance	0.05
Population 1 Sample	
Sample Size	744
Sample Mean	2.730511
Sample Standard Deviation	1.063728
Population 2 Sample	
Sample Size	802
Sample Mean	2.758728
Sample Standard Deviation	1.163084
t Test Statistic	-0.49656
Upper Critical Value	1.645841
p-Value	0.690214

Table 1. T-Test Analysis of Students Ability in Software Usage

The analysis suggests that there is no difference in the mean GPA scores of students in the fall versus the spring. If students were becoming more adept at the use of software applications due to their exposure to computers and applications prior to taking the ITM 200 course, we would expect there to be a significant difference in scores as we moved into the future. Our analyses do not seem to indicate that this is the case.

An ANOVA was also conducted, and it also failed to find a significant difference in Quality Points (GPA) between terms. The University evenly splits the incoming freshman class between fall and spring semesters for this course. The higher size of the spring term reflects the fact that 39 students were required to retake the course due to earning a failing grade. Another 62 were eligible to retake the course to replace grades of CD or lower per university policy. Thus 13.8% of students earned scores of "C" or lower in the fall. The spring semester was strikingly similar with 41 failures and another 71 eligible to retake the course (13.9%). (See Table 2)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.307	1	.307	.247	.620
Within Groups	1924.281	1544	1.246		
Total	1924.589	1545			

Table 2. ANOVA Examining Relationship between GPA and Terms

However, as shown in Table 3, an ANOVA examining the relationship between GPA and College found a significant difference. This may indicate that ITM 200 in its current format may not be needed by students entering the university, but may instead be more needed by students entering certain colleges. Those students entering the College of Natural and Health Studies and the College of Social Sciences, Math, and Education perform significantly better than those who were undecided or entering other colleges.

College	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
Arts & Letters	289	2.671	1.0878	.0640	2.545	2.797
Natural and Health Studies	454	2.987	1.0032	.0471	2.894	3.079
Business	361	2.598	1.1562	.0609	2.479	2.718
Continuing Studies	3	2.500	1.3229	.7638	-.786	5.786
Social Sciences, Math & Education	259	2.832	1.0491	.0652	2.704	2.960
Undecided	180	2.428	1.3012	.0970	2.236	2.619
Total	1546	2.745	1.1161	.0284	2.689	2.801

Table 3. ANOVA Examining Relationship between GPA and College

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	56.132	5	11.226	9.253	.000
Within Groups	1868.456	1540	1.213		
Total	1924.589	1545			

Table 4. ANOVA Examining Relationship between GPA and Terms

DISCUSSION

Due to their use **of** the internet and social media, many students come to universities today assuming they have the requisite computer skills to be successful in college. This study examined all students who were enrolled in ITM 200 over the course of two semesters. Only those students who were unable to pass a competency exam were required to take the course. While different students took the course during the two semesters, the students were from the same admission year. We failed to show a significant difference between the scores of students in the fall versus the spring semester. This seems to indicate that time and exposure to computers outside a classroom training session does not provide enough experience with software or the ability to function competently with the software at the level required of university students. Upon completion of the course, mean student performance as indicated by GPA is 2.745 or a B- or BC average. This indicates that while students may have grown up using computers for entertainment and writing papers, they still need instruction on the software that is commonly used in everyday life, namely, the Microsoft Office Suite in order to complete the tasks necessary for college students.

While it seems that our ITM 200 course is necessary, we need further study to determine whether students in all colleges at our university require this course in its current format. Students in the College of Natural and Health Studies and the College of Social Sciences, Math, and Education performed significantly better in the course than students from the other colleges. We need to determine if these differences are because students in these two colleges arrive at the university already knowing how to use the software or if they perform significantly better because they learned more using the CBT package from the ITM 200 course.

LIMITATIONS OF STUDY

This study only looked at final grades for the course. A more powerful argument could be made for the course if we were able to do a direct comparison of individual student scores on each application to determine whether all three modules of the Office Suite required training or not. It is possible that students are familiar enough with Word or another word processing program that they really don't require training in this area but do require assistance in learning Excel and/or PowerPoint. A pre-test/post-test format will allow for such a comparison and is being considered for future study. A multi year comparison would enable the researchers to see trends over semesters. We are in the process of collecting data this academic year to allow us to compare students from different year groups to determine whether students are coming to university with more computer skills than they did in the past.

RECOMMENDATIONS AND CONCLUSION

While today's college students have grown up in the information age, the results of our study indicate that they still require training on the basic software applications that they will need to be successful in college and beyond. We need to further examine and determine if software application skills are enough content for an Introduction to Computers course or whether other digital literacy topics (for example, the use of electronic media, electronic research skills, etc.) need to be added to the curriculum while some topics may be eliminated. We have begun a study of digital literacy at our university to examine these questions as we continue to provide necessary training for our students in software applications.

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